

REMARKS

I. STATUS OF THE CLAIMS

Claims 91-163 are canceled.

New claims 164-184 are added.

In view of the above, it is respectfully submitted that claims 164-184 are currently pending.

II. REJECTION OF CLAIMS UNDER 35 USC 102(E) AS BEING ANTICIPATED BY DUGAN ('662) AND ANTOS

New claims 164-184 recite a "multi-stage optical amplifier" which includes a first amplifier, a dispersion compensator and a second amplifier. Neither Dugan ('662) nor Antos discloses or suggests such a "multi-stage optical amplifier."

Further, various of the claims (such as, for example, claims 164, 168, 172 and 183) specifically recite a WDM optical signal. Dugan ('662) does not disclose the transmission of a WDM optical signal, and does not disclose that the invention of Dugan ('662) can be applied to a WDM optical signal.

III. REJECTION OF CLAIMS UNDER 35 USC 103 OVER DUGAN ('662) OR ANTOS WHEN TAKEN WITH PRIGENT

New claims 164-184 recite a "multi-stage optical amplifier" which includes a first amplifier, a dispersion compensator and a second amplifier. None of the references, taken individually or in combination, discloses or suggests such a "multi-stage optical amplifier."

Further, various of the claims (such as, for example, claims 164, 168, 172 and 183) specifically recite a WDM optical signal. Neither Dugan ('662) nor Prigent disclose the

transmission of a WDM optical signal optical signal, or that their inventions can be applied to a WDM optical signal.

IV. Title

The Examiner requires a more descriptive Title. Therefore, the Title is amended herein to be "OPTICAL AMPLIFIER WHICH COMPENSATES FOR DISPERSION OF A WDM OPTICAL SIGNAL".

V. IDS

The Examiner initialed various references on Form-1449 of the IDS filed June 11, 1998, thereby acknowledging these references. However, the Examiner did not initial reference AK, "Functional Characteristics of Interoffice and Long-Haul Line Systems Using Optical Amplifier, Including Optical Multiplexers," on the Form-1449. This appears to be an oversight by the Examiner.

Therefore, it is respectfully requested that the Examiner initial reference AK on the Form PTO-1449, to clearly acknowledge the reference.

VI. CONCLUSION

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any further fees are required in connection with the filing of this response, please charge such fees to our Deposit Account No. 19-3935.


Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please cancel claims 91-163, without prejudice or disclaimer.

Please ADD the following NEW claims:

164. (NEW) An apparatus comprising:
- a multi-stage optical amplifier including
 - a first amplifier amplifying a wavelength division multiplexed (WDM) optical signal,
 - a dispersion compensator compensating dispersion given to the amplified WDM optical signal and outputting a dispersion compensated WDM optical signal, and
 - a second amplifier amplifying the dispersion compensated WDM optical signal.
165. (NEW) An apparatus as in claim 164, wherein the first and second amplifiers are erbium doped optical fiber amplifiers.
166. (NEW) An apparatus as in claim 164, wherein the dispersion compensator is a dispersion compensation fiber.
167. (NEW) An apparatus as in claim 164, wherein the first and second amplifiers have a combined gain to output the dispersion compensated WDM optical from the second amplifier at a power level sufficient to be received by an apparatus downstream of the second amplifier.
168. (NEW) An apparatus comprising:
- a multi-stage optical amplifier including
 - a first amplifier amplifying a wavelength division multiplexed (WDM) optical signal,
 - a dispersion compensator providing dispersion compensation to the amplified

WDM optical signal, and

a second amplifier amplifying the WDM optical signal provided with dispersion compensation by the dispersion compensator.

169. (NEW) An apparatus as in claim 168, wherein the first and second amplifiers are erbium doped fiber amplifiers.

170. (NEW) An apparatus as in claim 168, wherein the first dispersion compensator is a dispersion compensation fiber.

171. (NEW) An apparatus as in claim 168, wherein the first and second amplifiers have a combined gain so that the WDM optical signal is output from the second amplifier at a power level sufficient to be received by an apparatus downstream of the second amplifier.

172. (NEW) An apparatus comprising:

a multi-stage optical amplifier including

a dispersion compensator providing dispersion compensation to a wavelength division multiplexed (WDM) optical signal,

a first amplifier positioned upstream of the dispersion compensator, and

a second amplifier positioned downstream of the dispersion compensator, wherein a combined gain of the first and second amplifiers is sufficient to compensate a loss in the dispersion compensator and to output the WDM optical signal from the second amplifier with an output power for transmission downstream of the second amplifier.

173. (NEW) An apparatus as in claim 172, wherein the dispersion compensator is a dispersion compensation fiber.

174. (NEW) An apparatus as in claim 172, wherein the first and second amplifiers are erbium doped fiber amplifiers.

175. (NEW) An apparatus comprising:

a multi-stage optical amplifier including

a first amplifier amplifying a plurality of optical signals, each having a different wavelength,

a dispersion compensator providing dispersion compensation to the amplified plurality of optical signals, and

a second amplifier amplifying the plurality of optical signals provided with dispersion compensation by the dispersion compensator.

176. (NEW) An apparatus as in claim 175, wherein the first and second amplifiers are erbium doped optical fiber amplifiers.

177. (NEW) An apparatus as in claim 175, wherein the dispersion compensator is a dispersion compensation fiber.

178. (NEW) An apparatus comprising:

a multi-stage optical amplifier including

a dispersion compensator providing dispersion compensation to a plurality of

optical signals, each having a different wavelength,

a first amplifier positioned upstream of the dispersion compensator, and

a second amplifier positioned downstream of the dispersion compensator, wherein a combined gain of the first and second amplifiers is sufficient to compensate a loss in the dispersion compensator and to output the plurality of optical signals from the second amplifier at output power for transmission downstream of the second amplifier.

179. (NEW) An apparatus as in claim 178, wherein the dispersion compensator is a dispersion compensation fiber.

180. (NEW) An apparatus as in claim 179, wherein the first and second amplifiers are erbium doped fiber amplifiers.

181. (NEW) An optical transmission system comprising:

a multiplexer wavelength-division-multiplexing a plurality of optical signals, each having a different wavelength, into a multiplexed optical signal, and outputting the multiplexed optical signal to an optical fiber;

a multi-stage optical amplifier, optically coupled to the optical fiber, including

a first amplifier amplifying the multiplexed optical signal from the optical fiber,

a dispersion compensator providing dispersion compensation to the amplified multiplexed optical signal to thereby output a dispersion compensated multiplexed optical signal, and

a second amplifier amplifying the dispersion compensated multiplexed optical signal to thereby output an amplified, dispersion compensated multiplexed optical signal;

and

a demultiplexer wavelength-division-demultiplexing the amplified, dispersion compensated multiplexed optical signal into respective optical signals.

182. (NEW) An optical transmission system as in claim 181, wherein a combined gain of the first and second amplifiers is sufficient to compensate a loss in the dispersion compensator and to output the amplified, dispersion compensated multiplexed optical signal from the second amplifier at an output power for transmission downstream of the multi-stage optical amplifier.

183. (NEW) An optical transmission system comprising:

an optical transmitter outputting a wavelength division multiplexed (WDM) optical signal to an optical fiber;

a multi-stage optical amplifier, optically coupled to the optical fiber, including

a first amplifier amplifying the WDM optical signal received from the optical fiber,

a dispersion compensator providing dispersion compensation to the amplified WDM optical signal to thereby output a dispersion compensated WDM optical signal, and

a second amplifier amplifying the dispersion compensated WDM optical signal to thereby output an amplified, dispersion compensated WDM optical signal from the multi-stage optical amplifier; and

an optical receiver receiving the amplified, dispersion compensated WDM optical signal output from the multi-stage optical amplifier.

184. (NEW) An optical transmission system as in claim 183, wherein the first and second amplifiers have a combined gain so that the amplified, dispersion compensated WDM optical signal

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is output from the multi-stage optical amplifier at a power level sufficient to be received by the receiver.